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BULLETIN
of the
ECOLOGICAL SOCIETY OF AMERICA

Vol 2 FEBRUARY, 1918. No. 2

Published monthly by the Ecological Society of America. Forrest Shreve, Secretary-Treasurer, Tucson, Arizona.

Entered as second class mail matter January 24, 1917, at the Post Office at Tucson, Arizona under the Act of August 24, 1912.

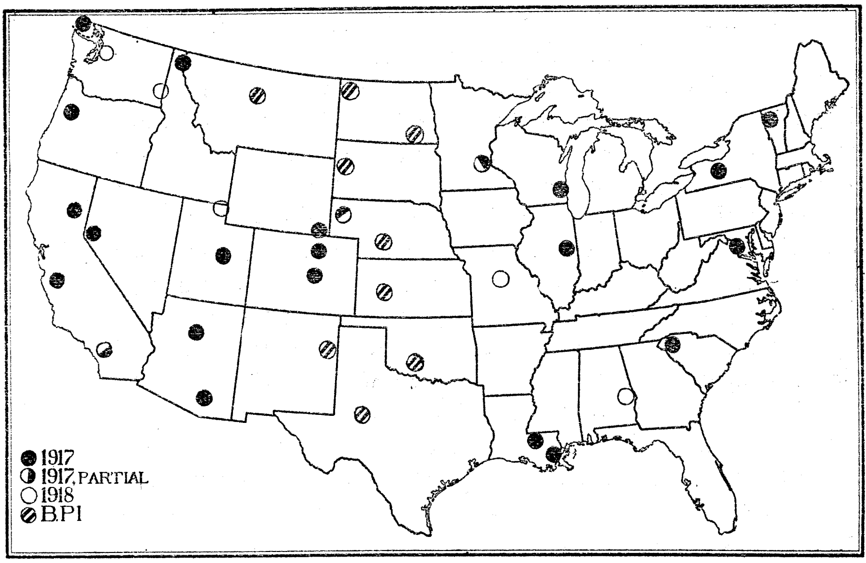
COMMITTEE ON SOIL TEMPERATURE.

Forrest Shreve, Chairman.

The work of this committee has taken the form of organizing a soil temperature survey of the United States and Canada. The aim has been to secure continuous readings of soil temperature for a least two or three years under conditions so nearly uniform as to make the various records comparable. From the assembled data is should be possible to draw maps showing the annual and monthly isotherms of soil temperature. The great importance of this environmental condition in both animal and plant ecology, and in the management of field and forest crops, taken together with the scattered and uncomparable nature of the readings hitherto secured, gives promise of some value for the results of the survey.

At the majority of the stations readings have been secured by means of soil thermographs, while at several others, thermometers have been used. At most of the stations the instruments are placed at a depth of three inches, at a number of other stations at twelve inches. Six of the stations are securing readings at both of these depths. The importance which attaches to the soil temperature at three inches is chiefly in connection with the germination and growth of annual plants and field crops, and in connection with the activities of organisms which operate near the surface of the soil. The temperature at twelve inches is of greater importance with respect to trees, deep-rooted plants and insects which hibernate well below the surface. These depths were selected after seeking the advice of a number of workers in different fields, and they appear to be the depths from which data are most apt to be generally useful. The instruments have been placed in level, well-drained and unshaded situations, and an effort has been made by the co-operators to keep the soil above them free from sod or heavy growth of weeds, without subjecting it to continuous cultivation. The soil surrounding the instruments has been the prevailing soil in the vicinity of each station, an effort being made to avoid sand and heavy clay, except where these are the only soils to be found.

The accompanying map indicates the location of the stations that were in operation during all or a part of 1917, the stations that will participate during 1918, and a selected series of the stations maintained by the Office of Dry Land Agriculture, of the Bureau of Plant Industry. It will be noted that there are some very large gaps in the distribution of the stations, a circumstance which is greatly to be regretted and one that will seriously impair the value of the results. A larger number of stations would make it possible to draw the isotherms of soil temperature with much greater accuracy, and would therefore greatly increase the utility of the results in the different sections of the country.



It would have been impossible for the committee to have made any progress whatever with this project if it had not been for the helpful interest and splendid co-operation of the men who secured data at the various stations. Funds for the purchase of instruments have been forthcoming from a number of institutions, and in several cases much more has been done than the co-operators were asked to do. This is especially ture in cases where more than one record has been secured. The committee has been fortunate in eliciting th interest of several men who have long been interested in soil temperature, and is indebted to them for the permission to use their readings, taken under a variety of special conditions which it would be extremely valuable but wholly impracticable to duplicate at each of the stations. Professor Burns has supplied parallel series of readings in shade and open at Burlington, Vt. Dr. McCall has supplied readings at different depths at College Park, Md. Professor Edgerton has supplied readings taken in bluff and alluvial soils in Louisiana. Mr. Pearson has taken readings at several depths at Flagstaff, Ariz., as well as readings at different altitudes on the San Francisco Mountains. Mr. Bates and Mr. Sampson have also secured readings at different altitudes in Colorado and Utah.

The actual readings for 1917 are now being collated for preservation. It is the belief of the committee that the conservatism of soil temperature will make it possible to draw relatively accurate isotherms of mean and extreme soil temperatures from a three years' record. It goes without saying, however, that it would be highly desirable to have a similar series of stations in operation for a long period of years.

The Chief of the Weather Bureau has been good enough to offer to the Society the facilities of the publications of the Bureau for the printing of the results of the soil temperature survey as they accrue from year to year. In order to make the data available as promptly as possible, it seems highly desirable to embrace this very generous proposal.

Wherever records of soil temperature have been taken, by thermograph or by thermometer, for a period of five or more years, it will be possible to use the data in connection with those that are now being secured. Several such records have been located, but it is hoped that members of the society will bring any of which they know to the attention of the committee:

Following is a list of stations and co-operators:

Burlington, Vt.;	George P. Burns
Perry, N. Y.,	W. H. Burkholder
College Park, Md	A. G. McCall
Clemson College, S. C	H. P. Barss
Racine, Wis	W. B. Tisdale
Urbana, Ill	J. G. Mosier
St. Paul, Minn	E. C. Stakman
Columbia, Mo	Geo. M. Reed.
Auburn, Ala	Geo. L. Peltier
Baton Rouge, La	C. W. Edgerton
New Orleans, La	C. W. Edgerton
Scottsbluff, Neb	E. Mead Wilcox
Foxpark, Wyo	C. G. Bates
Boulder, Colo	Francis Ramaley
Manitou, Colo	C. G. Bates
Logan, Utah	Geo. R. Hill, Jr.
Ephraim, Utah	A. W. Sampson
Flagstaff, Ariz	G. A. Pearson
Tucson, Ariz	Forrest Shreve
Priest River, Idaho	J. A. Larsen
Vancouver, B. C	A. E. Cameron
Seattle, Wash	Geo. B. Rigg
Pullman, Wash	Ira D. Cardiff
Corvallis, Ore	M. B. McKay and C. W. Hungerford
Quincy, Cal	J. A. Mitchell
Reno, Nev	P. A. Lehenbauer
Spreckels, Cal	M. A. Klein
Redlands, Cal	Edw. N. Munns
Riverside, Cal	J. T. Barrett